

A NEW POISON-DART FROG (ANURA: DENDROBATIDAE) FROM THE FOREST OF SOUTHEASTERN COLOMBIA

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Abstract.—*Dendrobates myersi*, a new species of poison-dart from from the Colombian rain forest, is related to members of the *Dendrobates femoralis* species group. The new frog is terrestrial, diurnal, and probably territorial. Its call is a long series of double-noted chirps given by isolated individuals. In captivity *D. myersi* is aggressive toward other dendrobatids. The larva and reproductive characteristics of the new species are unknown.

Early in August 1972, near the Cacua Village of Wacará, I listened to the penetrating notes of a dendrobatid frog calling from the leaf litter of the forest floor. The call was a long series of double-noted chirps, unlike that of any frog I had heard before. I recorded the call with a Uher 4000 Report L tape recorder, and a Cacua Indian companion captured the brightly patterned frog where it sat at the base of a low shrub. The time was about one hour before sunset.

Since that initial encounter, I have obtained six additional specimens of this unusual frog, one of which was sent alive to Charles Myers of the American Museum of Natural History. Analysis of the skin gland secretions, to be reported by Myers elsewhere, together with the color pattern and unusual, apparently territorial call, show that these seven specimens represent an unnamed species of poison-dart frog.

Dendrobates myersi, new species

Fig. 1

Holotype.—UTA A-3989, adult male collected near Wacará (elev. 216 m, long. 69°53'W, lat. 1°08'N), Comisaria de Vaupés, Colombia, 2 Aug. 1972 by J. K. Salser, Jr., Vincente López, Arquelao Gallego, and W. F. Pyburn.

Paratypes.—UTA A-7634, juvenile collected at type-locality, 3 Aug. 1972 by J. K. Salser, Jr. and W. F. Pyburn; AMNH 104681, juvenile collected at type locality, 3 Aug. 1972 by J. K. Salser, Jr. and W. F. Pyburn; AMNH 102173 adult male (skinned carcass) obtained 21 April 1976 by Pyburn at Yapima (69°28'W, 1°03'N), Comisaria de Vaupés, Colombia; AMNH 104682, adult female obtained 5 Aug. 1974 by Nathan Waltz at Yapima; AMNH 104683, adult male obtained 2 Sept. 1975 by Nathan Waltz near



Fig. 1. *Dendrobates myersi*, paratype, AMNH 102173. SVL = 29.5 mm. From a color transparency by C. W. Myers.

Yapima; FM 1331, adult male collected 7 April 1979 by William W. Lamar near Mitú, Comisaria de Vaupés, Colombia.

Diagnostic characters.—A moderate sized *Dendrobates* with a snout-vent length in males of about 28 mm. Combinations of the following characteristics distinguish *Dendrobates myersi* from all other dendrobatid frogs: maxillary and premaxillary teeth present; toes basally webbed; first finger longer than second; tarsal tubercle and ridge present; omosternum present; no light dorsolateral stripe, sides black; a complete light ventrolateral stripe; dorsum brown; bright yellow flash colors in groin and on lower arm surface; voice a long series of double-noted chirps.

In general appearance, *Dendrobates myersi* resembles *D. femoralis* (Fig. 2) and *D. zaparo* of the *femoralis* species group of Silverstone (1976). *Dendrobates myersi* differs from *Dendrobates femoralis* in having an indistinct, or no, light dorsolateral stripe separating the brown back color from the black of the sides. *D. femoralis* has a complete, well defined, dorsolateral



Fig. 2. *Dendrobates femoralis* from Pebas (Loreto) Peru, AMNH 103570. SVL \approx 26 mm. From a color transparency by C. W. Myers.

stripe (Boulenger, 1883; Cochran and Goin, 1970) that is said by Silverstone (1976) to be yellow or golden color in life. I have seen color transparencies of live *D. femoralis* from Amazonian Peru (Loreto, Pebas) and from the Coppername River of Surinam (Saramacca, Raleigh Cataracts). The Peruvian specimen showed a pale cream-colored dorsolateral stripe and the one from Surinam showed a golden yellow stripe. There is also a difference between the two species in the marking on the thigh. In life, *D. femoralis* has, on the proximal part of its upper thigh surface, a sharply defined red or yellow diagonal mark that is not present in *D. myersi*. The upper thigh surface of *D. myersi* may be red, but the red area, when present, is distal and its leading edge is diffuse so that it does not form a sharply defined mark.

Dendrobates myersi differs from *D. zaparo* in the color and texture of the dorsal skin. In life the dorsum of *D. zaparo* is red (Silverstone, 1976), whereas live *D. myersi* has a brown dorsum, sometimes with evenly distributed dark reticulations or spots. Although the dorsum of both species is granular, the granules of *D. zaparo* are more densely packed together and more numerous than the granules of *D. myersi*. In preserved specimens, the dorsal

granules of *D. zaparo* are pale on a dark ground color, whereas the reverse is true of *D. myersi*.

With the possible exception of *Dendrobates tricolor*, all of the species in the *femoralis* group are much smaller than *Dendrobates myersi*. In preservative, *D. tricolor*, unlike *myersi*, has a yellow dorsum and a yellow or white dorsolateral stripe. The small species may further be distinguished from *D. myersi* as follows: *D. anthonyi* has light middorsal and dorsolateral stripes (absent in *myersi*); *D. boulengeri* has in life a complete yellow or red dorsolateral stripe (Silverstone, 1976) that fades to cream or white in preservative, and has an irregular, reticulated or spotted pattern on the upper thigh surface (both absent in *myersi*); *D. espinosai* is in life a red-backed frog (Funkhouser, 1956) that in preservative has a dark brown dorsum, no ventrolateral light stripe and sometimes an incomplete dorsolateral light stripe (*D. myersi* has a medium to light brown dorsum and a white ventrolateral stripe).

Description (five adults including the holotype).—A medium sized dendrobatid (Table 1) with teeth on the premaxillary and maxillary bones. Vocal slits are present in males, absent in females. The tongue is free laterally and posteriorly, and has prominent papillae on the lateral and anterior parts of its upper surface. Dorsal skin of the head, back and shank is granular; ventral and lateral skin surfaces are smooth. Some specimens have a poorly defined, glandular, dorsolateral ridge.

The lower eyelid is transparent. Males have two longitudinal pleat-like folds in the skin of the gula. The posterodorsal rim of the tympanum is concealed. There are basal webs between toes II and III and between III and IV. The tarsal tubercle is connected by a dermal ridge to a prominent inner metatarsal tubercle. The outer metatarsal tubercle is small but distinct and there are large, ovoid subarticular tubercles on the toes. On the hand, a large palmer tubercle is about twice the size of the thenar tubercle and there are well developed, rounded subarticular tubercles on the fingers. The first finger is longer than the second. An omosternum is present and the muscle tissue is pink.

In life the skin of the dorsum is medium to light brown with closely spaced, darker brown granules. The sides of the head and body are blue-black and there is no light dorsolateral stripe separating the dorsal color from the color of the side. The iris is golden, densely suffused with black. There is a pale cream ventrolateral stripe passing from below the nostril, along the upper lip and side of body, to the groin, where it becomes bright yellow. The black of the side extends to the anterior base of the thigh and around the posterior end of the body to, or nearly to, the vent. The blue-grey to dark brown of the gula and chest merges with dark reticulations and/or spots on the otherwise cream-white abdomen. Lower surfaces of the hind limbs are generally marked like the skin of the abdomen. The axilla, pos-

Table 1.—Measurements (in mm) of the type series of *Dendrobates myersi*.

Catalog number	Sex	Snout-vent length	Head width	Head length	Eye length	Snout to eye	Tympanum diameter	Tibia length	Third finger disc width	Third finger width
UTA A-3987*	♂	27.8	9.0	9.1	3.4	4.4	2.0	13.1	0.8	0.5
UTA A-7634	juv.	11.7	4.0	4.2	1.9	2.2	1.0	5.9	0.4	0.2
FM 1331	♂	26.4	9.1	9.7	3.7	4.5	1.6	12.7	0.9	0.5
AMNH 104682	♀	32.8	10.5	12.8	4.1	5.5	2.3	15.0	1.0	0.6
AMNH 102173†	♂	29.5								
AMNH 104683	♂	30.6	11.4	10.0	4.2	5.5	2.3	14.3	1.2	0.7
AMNH 104681	juv.	12.9	4.5	4.3	2.3	2.2	1.3	5.9	0.4	0.2

* Holotype.

† Skin and skeletal preparation.

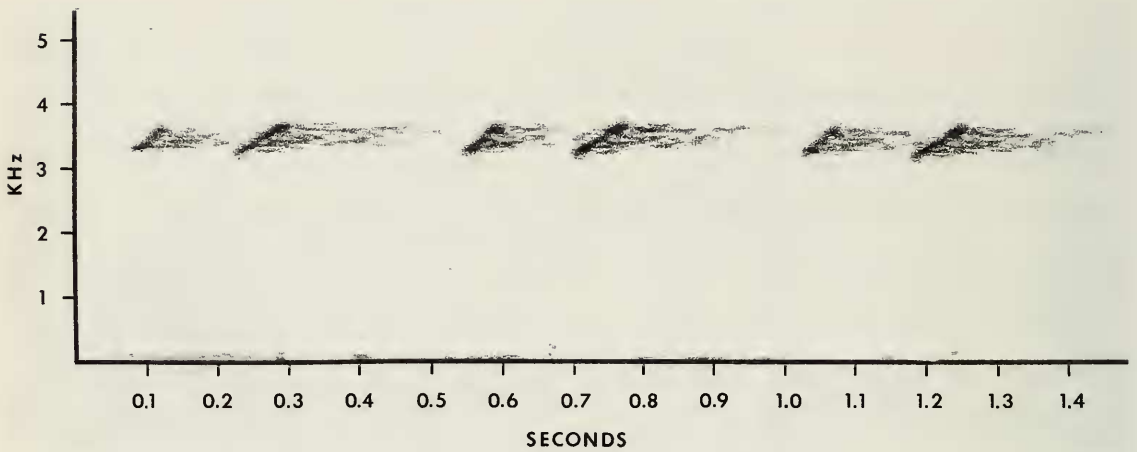


Fig. 3. Sound spectrogram (narrow band filter) of 6 notes (3 couplets) of *Dendrobates myersi* from a recording of the holotype at the type locality, 2 August 1972, air temp. $\approx 24^{\circ}\text{C}$.

terior surface of the upper arm, and anterior thigh surface are yellow. There is an irregular black band or group of black spots on the posterior thigh surface extending from the bend of the knee toward the vent; above this the thigh is reddish brown to coral red. The upper surface of the shank is medium brown with darker granules much like the dorsum. There is an irregular dark brown spot or stripe in the bend of the tarsus, and the fingers and toes may bear brown spots.

There is no sexual dimorphism in color pattern. The various color markings of the female are duplicated by one or more of the males.

Color of juveniles.—Two juveniles in the type series have the color pattern of the adults, except that the limbs of the young frogs are straw-colored to creamy pink and are unmarked.

Voice.—The call (Fig. 3) is a long series of whistle-like notes sometimes continuing for a minute or more if the caller is not disturbed. The notes are “chirp calls” (Myers and Daly, 1976), but unlike the chirps of other dendrobatids they are uttered in couplets or note pairs.

Two frogs at Wacar, timed with a stop watch, called at a rate of 228.6 notes per min (160 notes, air temperature about 24°C). Sound spectrograms show a dominant frequency band between 3100 and 3800 Hz and a note-pair duration of about 0.5 s.

Dendrobates espinosai is the only member of the *femoralis* group whose voice has been recorded and published as a sound spectrogram (Myers and Daly, 1976: Fig. 23). The voice of *D. espinosai* is a “buzz” consisting of a uniform series of pulses produced too rapidly to be resolved by the human ear. The call of *D. espinosai* does not resemble the easily resolved double note chirps of *D. myersi* (Fig. 3). Several dendrobatids produce calls consisting of evenly spaced chirps (Myers and Daly, 1976) but *D. femoralis* is

the only other species known to produce a double noted call. Duellman (1978) described the call of *D. femoralis* as “. . . a series of high-pitched, quickly repeated pairs of notes: ‘peep-peep, peep-peep, peep-peep.’” The apparent similarity in call and in morphology between *D. femoralis* and *D. myersi* suggests that these two species are closely related.

Natural history.—*Dendrobates myersi* is terrestrial and, like other dendrobatids, it is diurnal. Males call from isolated positions in the leaf litter on the forest floor. The frogs are not common and are always well separated from each other (10 m or more) when calling, suggesting that the call is a territorial advertisement. Myers (personal communication) observed a captive adult male *D. myersi* behaving aggressively toward dendrobatids of other species (*Phyllobates aurotaenia*, *P. vittatus* and *P. terribilis*) in the same terrarium. The *D. myersi* gave a short series of “peeps” and hopped on the other frogs. At other times it called from a certain, seemingly preferred, position in the terrarium.

In nature males of *D. myersi* answer to playback recordings of their calls. Most of the specimens were active when collected, but one (AMNH 104683) was found on a rainy day under cut palm leaves.

The larva and reproductive characteristics of *myersi* are unknown.

Remarks.—*Dendrobates myersi* is presently known only from the valley of the Vaupés River and its tributaries in southeastern Colombia. The Indians of the region (Cacua, Cubeo, Guanano) are familiar with this species, but they do not fear it and apparently do not use its skin secretions to poison their blow gun darts.

Myers et al. (1978) reassigned several species to the genus *Dendrobates* that were included in the genus *Phyllobates* by Savage (1968), Silverstone (1976), Cochran and Goin (1970), and others. Among the species reassigned to *Dendrobates* were members of Silverstone’s *femoralis* group, to which the new species apparently belongs. I have tentatively accepted the arrangement of Myers et al. (1978) and have therefore placed the Vaupés species in the genus *Dendrobates*.

Etymology.—This species is named for Charles W. Myers of the American Museum of Natural History in recognition of his innovative research in dendrobatid systematics.

Specimens Examined

Abbreviations: AMNH, American Museum of Natural History, New York; FM, Federico Medem private collection, Villavicencio, Colombia; USNM, JAP, National Museum of Natural History, Washington, D.C.; UTA, University of Texas at Arlington, Arlington, Texas; CWM, Charles W. Myers field series.

Dendrobates anthonyi Noble—ECUADOR: El Oro, 3 km E Pasaje, 30 m (AMNH 89630–635).

Dendrobates boulengeri Barbour—COLOMBIA: Nariño, Isla Gorgona, Gorgonilla (AMNH 62892–93), near prison camp (USNM 145248, 145249–52).

Dendrobates espinosai Funkhouser—ECUADOR: Pichincha, Rio Baba, 5–10 km SSW Santo Domingo de las Colorados, 500 m (AMNH 89671–76), Centro Científico Rio Palenque, 200 m (CWM 16021–024); Rio Blanco, near mouth of Rio Yambi, about 700 m (USNM 204506–10).

Dendrobates femoralis Boulenger—BRASIL: Amazonas, Igarape Puruzino, Rio Madeira (USNM 201861–63), Curuca, Rio Madeira (USNM 201864); GUYANA: Kartabo (AMNH 39679–80); PERU: Loreto, Centro Union, lower Rio Aucayo, 20 km SE Iquitos, 3°48'S, 73°3'W (AMNH 88526–28).

Dendrobates tricolor Boulenger—ECUADOR: Azuay, Rio Minas, 20 km W Santa Isabel on Cuenca-Machala Rd, 1250 m (USNM 166897, JAP 3600–01, 3606–08), ca. 16 km W Santa Isabel, 1000 m, Rio Jubones drainage (CWM 16025–029).

Dendrobates zaparo Silverstone—ECUADOR: no specific locality (AMNH 52881); Pastaza, 0.5 NE Puzo, 985 m (USNM 204534); Vera Cruz, about 10 km E Puzo, 1016 m (USNM 204544–45); Cabeceras del Rio Bobonaza, Camino a Guamajaco, 677 m (USNM 204546); 2 km S Shell Mera, 985 m (USNM 204547); PERU-ECUADOR frontier: Gauches (on Rio Pastaza) (AMNH 52882).

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